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# CARCINOMA OF THE MAMMA.

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MR. STILES prefaced his remarks by demonstrating a series of photographs with the limelight to illustrate the morbid anatomy and histology of carcinoma of the mamma. He was, he said, indebted to the surgical staff of the Edinburgh Royal Infirmary, and of Chalmers Hospital, Edinburgh, for the material for investigation. During the past three years he had examined over a hundred breasts affected with carcinoma. He had to thank Mr. Andrew Pringle for the beautiful photographs he had made of the microscopic preparations. His (Mr. Stiles's) observations led him to the following conclusions:—

1. That the cancer in about 90 per cent. of the cases assumed the form of a single, non-encapsulated, clearly defined, but microscopically infiltrating tumour.

2. That although the naked-eye appearances of the tumours varied considerably, their histological structure was essentially the same in all, consisting, that is, of clusters of modified epithelial cells situated in the lymph spaces and lymphatic vessels of a vascular connective tissue stroma.

3. That the epithelial elements of the tumour differed so widely from the epithelial cells of the adjacent and surrounding gland parenchyma that the old term "cancer cells" might with advantage be applied to them. In properly prepared sections the two kinds of cells, when viewed in the same field, might readily be distinguished from one another. The acinous epithelial cell of the resting mammary gland possessed a small spheroidal nucleus with abundance of chromatine uniformly distributed throughout it. The cells were almost invariably uninucleated; mitotic figures were rarely met with, and fragmentation of the nucleus did not occur. The perinuclear substance was small in amount. Swollen and degenerated epithelial cells were not infrequently seen heaped up in the ducts. The nucleus of the cancer cell, on the other hand, was two or three times the size of that of a normal epithelial cell. The chromatine was relatively much less in amount; the nuclear membrane was very distinct, and the whole nucleus presented a distinctly vesicular appearance. Cells undergoing normal, and in some cases abnormal, mitosis were met with abundantly. Multinucleated cells and cells with fragmented nuclei were common, especially in rapidly-growing tumours. The cancer cell might contain one or more leucocytes in its interior and some-

times the whole cell appeared to have been destroyed by leucocytes.

4. That the stroma of the tumour consisted partly of the pre-existing tissue and partly of a newly-formed tissue, the result of an inflammatory connective tissue hyperplasia, which was secondary to the irritation produced by the cancer cells. In the meshes of the stroma were leucocytes more or less numerous.

5. That the cancer cells lay loose in the tissue spaces of the stroma, and were therefore liable to be washed into the lymphatics by the lymph stream. Probably they possessed a certain degree of independent movement.

6. That the duct and intracystic epithelial papillomata which were sometimes met with in the breast, especially in connection with chronic inflammatory affections, were epithelial hyperplasias, which were secondary to a vascular and connective tissues hyperplasia. Such epithelial hyperplasias were to be distinguished from carcinoma, not only microscopically, but also clinically, since they did not, as far as he was aware, give rise to secondary growths in the lymphatic glands and internal organs.

7. In addition to the primary tumour, which represented the primary focus of disease, secondary cancerous foci made their appearance sooner or later; they were more or less numerous and extensive in different cases. When numerous, extensive, and of early origin they might give rise to a cancerous infiltration of the entire gland, and produce what was termed a "diffuse carcinoma." Carcinoma of the mamma, originating as a cancerous transformation of the entire gland parenchyma, rarely, if ever, occurred.

8. That the secondary cancerous foci, which were found in the extrinsic tissues of the mamma were due to lymphatic dissemination of cancer cells, derived more or less directly from the primary tumour. No spermatic influence was exerted by these cancer cells upon the cells proper to the tissues in which they lay, so that the latter were never transformed into cancer cells.

9. The smaller cancerous foci which were occasionally found in the breast tissue, more or less distant from the main tumour, appeared also, as far as his observations went, to be the result of lymphatic dissemination of pre-existing cancer cells, rather than to arise as independent foci. Cancer originating in the form of multiple foci was as rare in the mamma as it was elsewhere in the body.

10. Those lobules of the parenchyma which were about to be invaded by the cancer were at first the seat of an inflammatory reaction, which might be either acute or chronic. When acute the lobule was infiltrated with leucocytes. Ultimately the adjacent cancer cells invaded the substance of the lobule, and completed the destruction already begun by the leucocytes. When the reaction was chronic, hyperplasia of the interacinous connective tissue occurred, and gave rise to a certain amount of proliferation of the epithelial cells of the acini, which, however, was not of a cancerous nature.

11. Various conditions of the parenchyma were met with here and there throughout the gland in carcinomatous mammæ. In many instances the parenchyma appeared to be perfectly normal. In others, again, catarrhal changes, plugging of ducts with degenerated products, cystic changes, and interstitial inflammation were met with. Many of these changes had been re-

garded by Heidenhain and others as "precancerous." Such conditions, however, were far removed from cancer proper, and he (Mr. Stiles) had never succeeded in tracing the further stages of their development into cancer. Moreover, these so-called precancerous conditions were equally well seen in breasts which were free from cancer, for example, in chronic circumscribed mastitis, in diffuse lobular mastitis, and in multiple cystic disease, with and without intracystic and duct papillomata. After inquiring carefully into the clinical histories of all the carcinomata he had examined, Mr. Stiles had not been able to trace any special etiological relationship between mastitis and carcinoma.

12. By the *nitric acid method* he had shown that the gland parenchyma extended much farther in all directions than was generally supposed, and that the surgeon frequently fell short of his intention to remove the entire breast. He agreed with Mr. Butlin [1] who had said: "Certainly in the majority of instances there is nothing to lead one to believe that the new growth (recurrence) arises in the outlying lobules of the mammary gland, or in any remains of the parenchyma of the gland." Mr. Stiles's own observations all tended to show that when cancer manifested itself in breast tissue which had been left behind, the disease originated in the majority of cases from pre-existing cancer cells, derived directly or indirectly from the primary tumour, and occupying the lymph spaces or lymphatics of the stroma. In other words, "recurrence" originated in breast tissue which had been left behind in the same way as "recurrence" in the tissues extrinsic to the mamma. It was not difficult, therefore, to understand how partial excisions of the mamma occasionally succeeded, while more radical operations in other cases might fail to prevent recurrence. The principle which should underlie all operations for carcinoma of the mamma should be the complete removal, not only of the tumour and of the breast, but also of as much of the surrounding tissues as was likely to contain the lymphatic spaces and highways along which the malignant elements of the disease had been disseminated. Unfortunately, it was impossible in any given case to say to what extent this might have taken place, and herein lay the difficulty and uncertainty of the operative treatment for carcinoma.

[1] *The Operative Surgery of Malignant Disease*, p. 378.